physical measurements for small boys, following Board School methods; but that in the latter institutions mathematical and science teaching were continuous, the same master teaching both to the same boys. In public schools the two subjects are kept separate. Much of what is now taught in the laboratory could more usefully be acquired in mathematical class-rooms with all the necessary apparatus. Mathematics would gain enormously, and much valuable science time be saved. Here Mr. Eggar submitted that he was only urging the adoption of practical mathematics which Prof. Perry had long advocated, and without opposition, but also without any visible effect upon the universities, which still, among other things, demanded a modicum of unapplied and undigested algebra. Sir Henry Roscoe bore out what Mr. Eggar had said, and proposed that a meeting of mathematical masters should be held, at which Prof. Perry might possibly convince them. Speaking as a mathematical master, Mr. Hurst, of Eton, cordially agreed with the views of Prof. Perry and Mr. Eggar; he stated, however, that limited time and the requirements of the universities utterly forbade their adoption in his own case. Another point emphasised by Mr. Eggar was that trigonometry mechanics should be introduced at an earlier stage into the teaching of mathematics, and his resolution that "some knowledge of physics should be required of all candidates for a university degree," was carried unanimously.

The universities came in also for a good deal of criticism, among other examining bodies, from Mr. C. Falkner, of Weymouth. Their entrance science scholarships cause boys to specialise while too young, and before they have got a sound foundation upon which to base their education. No college seems to require the same scope of science, and this necessitates what amounts to the private coaching of every boy in the scholarship class of a public school. Mr. Falkner had some very good suggestions to make for the improvement of these and army examinations, and repeated the plea that is now finding much favour, that teachers and examiners should meet and work together.

The paper by Mr. W. H. Lewis, of Exeter, was not discussed, owing to the author's absence. It dealt with the desirability of longer hours and smaller classes, and larger staffs. The difficulty which a "literary" head-master has of realising the peculiarly laborious nature of science teaching where complicated apparatus has to be fitted up was also alluded to.

An interesting survey of the work of school natural history societies was to be found in the address by Mr. A. Vassall, of Harrow, and the discussion upon it. Many advantages were claimed for the subjects involved, from the education of future landowners and travellers as well as for the boys at school. The sectional system, which divides workers up into groups according to their study, was advocated. Compulsory games very often spoiled matters, and individualism, Mr. Vassall very rightly pronounced, was thereby extinguished. Public opinion among the boys and the standing aloof of those with influence, as well as the apathy of many masters, were also cited as obstacles in the way of field work at schools. Nevertheless, quite a number of successful societies at present exist.

Many suggestive methods of actually dividing up the time for teaching were given by various members of the conference; but, one takes it, the most useful purpose it will serve is to bring before head-masters, governors of schools, and examining bodies the results of the experience and the serious recommendations of a body of picked scientific men whose hearts are in their work. WILFRED MARK WEBB.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE annual meeting of the Association of Technical Institutions will be held on Tuesday, January 29, in the Fishmongers' Hall, London. An address will be given by Sir W. Hart Dyke, Bart., M.P.

WE learn from *Science* that Dr. D. K. Pearsons has given Colorado College 50,000 dollars, promised some time since, and it is reported that he has given Northwestern University 30,000 dollars for the erection of a woman's dormitory, and 200,000 dollars to an educational institution, the name of which is not to be made public during his life time. It is believed that Dr. Pearsons' gifts to educational institutions amount to three million dollars.

SCIENTIFIC SERIAL.

THE *Journal of Botany* for January contains a useful paper by Mr. Arthur Lister on the cultivation of the Mycetozoa from spores. Mr. George Murray and Mr. C. Bucknall contribute a discussion on the question whether the box, *Buxus sempervirens*, is a native of Britain. They conclude that this is unquestionably the case with the locality near Wootton-under-Edge, an adjacent farm having been known as "Boxwell" for at least seven centuries. This increases the probability of the shrub being indigenous also in other localities, including Boxhill, near Dorking. Mr. W. Carruthers and Miss A. Lorrain Smith have a paper on a disease in turnips caused by bacteria. Prof. Potter has named the bacterium *Pseudomonas destructans*.

SOCIETIES AND ACADEMIES.

LONDON.

Geological Society, January 9.—J. J. H. Teall, F.R.S., President, in the chair.—The geology of South-Central Ceylon, by John Parkinson. In this communication the author endeavours to give some account of the relations between the various granulitic rocks of Ceylon. A series of more or less isolated sections were studied, the rocks in each considered under separate heads, and conclusions put forward relative to the whole.—Note on the occurrence of corundum as a contact-mineral at Pont-Paul, near Morlaix (Finistère), by A. K. Coomára-Swámy. The intrusive granite of Pont-Paul, near Morlaix, contains highly altered fragments of sedimentary rock. The minerals found in them are biotite, muscovite, corundum (first recorded by Prof. Barrois in 1887), plagioclase, andalusite, pyrite, magnetite, sillimanite, green spinel, and zircon.

Mathematical Society, January 10.—Dr. Hobson, F.R.S., President, in the chair.—Prof. Love, F.R.S., made a communication on streaming motions past cylindrical boundaries. Mr. Basset, F.R.S., also spoke on the subject.—Mr. Campbell read a paper entitled "A Proof of the Third Fundamental Theorem in Lie's Theory of Continuous Groups."—The President communicated a paper by Mr. E. W. Barnes on the zeroes of Bessel's functions, and a paper on some cases of the solution of $z^{p^n-1} \equiv 1$, mod. p, by Prof. F. S. Carey.

Zoological Society, January 15.—Prof. G. B. Howes, F.R.S., Vice-President, in the chair.—Mr. W. E. de Winton exhibited and made remarks on a skin of the large grey Cynictis (*Cynictis selousi*), obtained by Mr. P. C. Reid on the west bank of the Linyanti River, South Africa. The species had been described from a skull only, from Bulawayo, and the skin of the animal had previously been unknown to naturalists.—Mr. O. Thomas exhibited, on behalf of Mr. R. Lydekker, a specimen of the skull of a common fox (*Canis vulpes*) with two upper canines on each side of the jaw.—In describing the collection of fishes brought home from Lakes Tanganyika and Kivu by the Tanganyika Exploring Expedition, under the leadership of Mr. J. E. S. Moore, Mr. G. A. Boulenger pointed out that the study of this important collection did not modify the conclusions embodied in his first report published in 1898. The exploration of Lake Kivu had thrown no light on the origin of the Tanganyikan fauna; the smaller lake proved to be very thinly populated with fishes, which all belonged to widely distributed genera, the species showing a mixture of Nile and Tanganyika elements, with two that might prove to be endemic. The list of the fishes from the two lakes comprised 91 species, 74 of which had been named by the author. The collection now described consisted of examples of 50 species, 26 of which were new to science, 2 being made the types of additional genera of the family *Cichlidae*.—Mr. G. A. Boulenger read a paper on a collection of freshwater fishes made by Dr. W. J. Ansorge in the Niger Delta. The collection was described as one of exceptional interest. One of the two new genera, for which the name *Phractolaemus ansorgii* was proposed, constituted the type of a new family (Phractolæmidæ), intermediate between the Osteoglossidæ and the Clupeidæ. The second new genus, *Polycentropsis*, belonged to the Nandidæ, a family new to Africa; its position was regarded as near the South American *Polycentrus*. A new *Gnathonemus* and three new *Pelmatochromis* were also described.—A communication was read from the Rev. O. Pickard-Cambridge, F.R.S., containing an account of some new and interesting spiders collected in South Africa by Mr. G. A. K. Marshall, and in the Malay Peninsula and Borneo by Mr. R. Shelford.—Mr. F. E. Beddard, F.R.S., contributed a fourth instalment of his notes on the anatomy of Picarian birds, which contained an account of the skeletons of the ground-hornbills (*Bucorvus cafer* and *B. abyssinicus*) and notes on other species of hornbills.—A communication from Dr. A. G. Butler contained notes on and a list of the butterflies recently collected by Captain H. N. Dunn on the White Nile.—Dr. F. G. Parsons read a paper on the muscles and joints of the giant golden mole (*Chrysochloris trevelyani*), based on an examination of three specimens of this animal. The author found that previous observations, which had been made on less material, though mainly correct, were somewhat inaccurate in details.

Entomological Society, January 16.—Annual Meeting. Mr. G. H. Verrall, the President, in the chair.—It was announced that the following had been elected officers for the session 1901–2. President, the Rev. Canon Fowler; Treasurer, Mr. R. McLachlan, F.R.S.; Secretaries, Mr. Herbert Goss and Mr. H. Rowland-Brown.—The President referred to the losses the Society had sustained during the past session by the deaths of Mr. Spence, the Baron de Selys-Longchamps, Mr. Blatch, Major G. Cockle, Mr. P. Crowley, Lord Dormer, Mr. J. H. Leech, Dr. W. H. Lowe, Prof. Joseph Mik, Prof. Emile Blanchard, Dr. Staudinger, and other entomologists. He then delivered an address, in which he dealt chiefly with the abuses and errors which have crept into entomological nomenclature and the reckless manner in which types of various genera are described from single specimens, without careful study of the many forms which a single insect may assume even in a limited locality. He especially deprecated the publication of supposed new species or varieties before their identity had been certainly established, where the object of the author was to claim something more than a contribution to material for determination. In the vexed problem of priority in nomenclature, he expressed himself all in favour of retaining distinctive names only when such names were neither offensive to good sense nor grammar, and cited instances in which a printer's error was still received as orthodox, while the obvious and original name given by the inventor was rigorously discarded. Lastly, in reply to those who have questioned the value of entomology as a science, he mentioned several amusing instances of what an experienced entomologist might do in the way of turning his knowledge to practical account. Commentators on the work of the late Robert Louis Stevenson were unable, but anxious, to discover whether the notes made by him in a certain book were written before or after he had taken up his residence in Samoa. A fly which had been squeezed between the pages settled the question, for Mr. Verrall at once pronounced the remains as those of an insect peculiar to the Polynesian islands.

Institution of Mining and Metallurgy, January 16.—Mr. A. G. Charleton, Vice-President, in the chair.—Notes on mine surveying, by G. A. Troye. In this paper the author refers chiefly to the practice in the Transvaal, and briefly describes the methods employed there. He aims at a high standard in a mine surveyor, who, he thinks, in addition to essential requirements, should be expected to be a competent geologist, with a thorough knowledge of the occurrence of ore deposits, their dislocations, &c. He considers that it is to him the management should appeal in cases of disturbed ground, and he, more than any one, should be able to quickly find a lode lost through displacement, and should be held responsible for the proper development of a mine. Numerous examples explain the different forms of calculation. Stress was laid upon the necessity of checking all survey work most carefully, and to attain this the co-ordinates are always calculated by the author from two sides of a triangle in order to obtain independent results. The traverses are calculated by inverse multiplication of the natural sines and co-sines of the angles of direction or bearings. A strong point is made in the paper of the desirability of having substantial permanent bench-marks both above and below ground, the latter being labelled with a numbered tin ticket. This, the author says, has proved of great advantage to the mine-manager, sampler, &c., and facilitates work of all kinds, especially when a change of staff takes place. Many useful hints are given as to conducting a survey, keeping the field-book and calculating results.—Paper on electro-silvered *versus* plain copper plates, by Edward Halse. In this paper the author deals with the question of the use of electro-silvered plates in gold milling in preference to plain copper plates, and quotes in support of his view various works on the metallurgy of gold. An important question to the mill-man is whether silvered plates extract more gold from the crushed ore, and the author is convinced from experience that this is the case and that therefore silvered plates should supersede plain copper plates in gold milling. He gives numerous tables of results in support of his view, and the paper contains much useful information. In the discussion it was pointed out that in many cases the percentage of gold extracted was low in consequence of the failure of the millman to keep his plates clean, and the importance of the increased use of "elbow-grease" rather than chemicals was strongly emphasised.—Note on an improved native gold-mill, by the same author. The note gives details of an improved mill worked by overshot water-wheel erected by the Colombian Mines Corporation at Antioquia, Colombia, where the water supply was much in excess of requirements.—Note on the geology of Lake Nyasa, by Alexander Richardson. The author describes Lake Nyasa as a sheet of clear water some 360 miles in length by from 14 to 40 miles in width, lying at an altitude of 1500 feet, its deepest part being 1000 feet below sea-level. After describing the geological formations he goes on to say that whilst as yet no valuable minerals have been discovered in British Central Africa, half-caste Portuguese at one time worked alluvial gold between the Angoni country and the Zambesi, and gives it as his opinion that workable gold will be found in the mountainous region to the west. For half the year the climate is wet and malarious and for the other half dry, cool and healthy.

Royal Meteorological Society, January 16.—The President, Dr. C. Theodore Williams, in the chair.—Annual General Meeting.—Reference was made to the celebration of the Society's Jubilee on April 3–4 last, and also to the death of Mr. G. J. Symons, F.R.S., who had amongst other things bequeathed to the Society about 2200 volumes and 4000 pamphlets from his valuable library.—Dr. C. Theodore Williams delivered the presidential address, taking for his subject the climate of Norway and its factors. He considered that its meteorology should prove an attractive study for the Society as having much in common with that of our country, both the Norwegian and the British shores being influenced by the same Gulf Stream, and having their winters and summers tempered by the same equalising agency. The factors which influenced the climate were: (1) the insular character of the country; (2) the distribution of the mountain ranges, which explains to a large extent the rainfall; (3) the waters of the ocean, which, from a variety of circumstances, come into close connection with much of the country and thus temper extremes of climate; and (4) the sun, which in this latititude remains in the summer long above the horizon, and in the winter long below it. The address was illustrated by a large number of lantern slides of Norwegian scenery, embracing mountains, glaciers, fjords, &c.—The election of officers and council for the ensuing year then took place, Mr. W. H. Dines being appointed president, and Dr. C. Theodore Williams treasurer.

Linnean Society, December 20, 1900.—Prof. S. H. Vines, F.R.S., President, in the chair.—Mr. B. Daydon Jackson exhibited two editions of Hill's "Flora Britannica," the earlier, of 1759, being apparently unknown to bibliographers. This edition differs from the usual issue of 1760 in having a different title-page, and publisher's name: the copy exhibited wants the plates mentioned on the title. The species ascribed to the genus Statice are three in number; in modern nomenclature one species of Armeria and two of Statice.—Prof. Howes, F.R.S., exhibited a couple of pigeon's egg-shells, cast up at the mouth by the tropical African egg-eating snake *Dasypeltis scabra*, now living in the Zoological Society's Gardens, and called attention to the presence of a series of spiral and longitudinal fracture-lines, pointing to an elaborate co-ordinate muscular activity in the "crushing" process, the probable nature of which he discussed, in the light of the recent investigations of Katheriner into the anatomy of the animal and the observations of Miss Durham upon its feeding habits.—Prof. Poulton, F.R.S., exhibited a living specimen of the death's-head moth (*Acherotia atropos*), and proved with a stethoscope that the late Prof. Moseley was correct in stating that the sound comes from the proboscis. He also showed that all sound ceased the moment the tip of the straightened proboscis was dipped in water, and could not be resumed until the organ was withdrawn ; thus supporting Prof. Moseley's opinion that the sound was produced by forcing air through the proboscis. Prof. Poulton also exhibited projected photographs of *Acraea unicolor* var. *alcippina* recently received from Sierra Leone by Mr. Herbert Druce, together with specimens of *Limnas chrysippus* var. *alcippus*, which they closely resemble. He showed that this Acræa is represented in the South and East Central regions of Africa by varieties which correspond to the respective forms of *L. chrysippus ;* that in fact the geographical coincidence between the two is much closer than with the forms of the female of *Hypolimnas misippus* and those of *L. chrysippus.* The former is one example of Müllerian mimicry, both forms being independently distasteful ; while the female Hypolimnas is generally regarded as a Batesian mimic.—Mr. Arnold T. Watson read a paper on the structure and habits of the Ammocharidæ, a group of marine Polychæte worms which inhabit sandy localities and are protected by tubes of unique structure.—Mr. I. H. Burkill read a paper on the flora of Vavau, a little known island of the Tonga group, on which some remarks were made by the President.

PARIS.

Academy of Sciences, January 14.—M. Fouqué in the chair.—The President announced to the Academy the death of M. Ch. Hermite, member of the Section of Geometry, and of M. Adolph Chatin, member of the Section of Botany.—On the theory of precession, by M. H. Poincaré. The secular variations of the terrestrial equator, as determined by Stockwell, lead to an entirely different coefficient from that obtained by Backlund using the method of Gylden. It is shown on analysis that the coefficients obtained by Stockwell are correct, there being a fundamental error in the method of Gylden.—Researches in the formation of organic sulphur compounds, by M. Berthelot. A study of the thermal properties of the mercaptans, the heats of combustion and formation of ethyl mercaptan, ethyl sulphide, amyl mercaptan, amyl sulphide, and allyl sulphide being given. —New researches on the isomerism of the sulphocyanic ethers, by M. Berthelot. Measurements of the heats of combustion and formation of phenyl isosulphocyanide.—The gaseous products disengaged by the action of heat from some igneous rocks, by M. Armand Gautier. Granites from different sources were heated in a vacuum with syrupy phosphoric acid, the gas evolved measured and analysed. The quantities found were very considerable, varying from 560 c.c. to 5438 c.c. per kilogram. The gases found consisted of sulphuretted hydrogen, carbon monoxide and dioxide, methane, hydrogen, nitrogen and argon. From analyses of the gases given off at different stages, it is shown that the gases are not simply stored up in the rock, but result from reactions at the temperature of the decomposition.—On the effects of the substitution of alcohol for sugar in food upon muscular action, by M. A. Chauveau. The question as to how far alcohol can replace sugar in a mixed diet is of considerable physiological interest, the question being attacked by means of the respiratory coefficient. As a net result of a lengthy series of experiments upon a dog, it is concluded that the alcohol introduced, although very rapidly absorbed by the organism, only participates to a very small extent, if at all, in the combustions from which the muscular system draws the energy necessary to its working. The alcohol is not an energy producing food, its introduction into a food having rather the opposite effect.—On the new Giacobini comet, by M. Perrotin.—On quadruply periodic functions, by M. Georges Humbert.—On orthogonal systems admitting of a group of Combescure transformations, by M. D. Th. Egorov.—On the correlation of the experiments made at Dijon in 1894 for the application of the idea of a common return for telephonic circuits, and on experiments made since 1894 on telephony without wires, by M. Rheins.—Action of hydrogen upon bismuth sulphide, by M. H. Pelabon. The action between hydrogen sulphide and bismuth is a reversible one, and has been studied experimentally by the author at a temperature of 610° C. Three reactions were studied, hydrogen and the sulphide of bismuth, hydrogen sulphide and bismuth, and hydrogen with a mixture of sulphur and bismuth.—On the chlorobromides of thallium of the type $\mathrm{TlX_3 3TlX}$, by M. V. Thomas.—On the combinations of the chlorides of phosphorus with boron bromide, by M. Tarible. Bromide of boron in presence of the chlorides of phosphorus react with great facility to form double compounds. These bodies, which are well crystallised, are decomposed by cold water, by chlorine, and by ammonia.—On the new mode of preparing hydrated sodium peroxide, and their properties, by M. George F. Jaubert. Although sodium peroxide when treated with water is decomposed into oxygen and caustic soda, if treated with moist air free from carbonic acid, no decomposition takes place, water being absorbed and hydrates formed. Hydrated sodium peroxide is stable in the cold, and may be kept for six months without appreciable alteration.—Determination of the latent heats of vaporisation of some substances in organic chemistry, by M. W. Louguinine. Figures are given for aniline, methylethylacetoxime, anisol and butyronitril —Study of uranium nitrate, by M. Œchsner de Coninck. Determinations of the densities of solutions of uranium nitrate in nitric and sulphuric acids.—The oxidising action of ammonium persulphate upon some immediate principles of the organism, by M. L. Hugounenq. A study of the oxidation of uric acid, bilirubin, hematin and blood by ammonium persulphate.—On the structure of the vascular plants, by M. G. Chauveaud.—On the occurrence of a mineral smelling of free fluorine at Beaujolais, by M. Jules Garnier.—On the Neomylodon and the mysterious animal of Patagonia, by M. André Tournouër.

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